

DETAILED ACTION

Claim Rejections - 35 USC § 103

Claims 1, 3, 4, 6-11, 13 and 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Koitabashi et al. (US 6,916,092) in view of Koike et al. (US 5,608,438).

Regarding claim 1:

Koitabashi et al. ('092) teaches an ink-jet recording method in which recording is executed by discharging inks of different colors as droplets of ink to be attached onto a recording material (Fig 1; column 9 lines 44-49, column 10 lines 1-8), comprising:

discharging successive ink droplets using a line head ink-jet printer (Fig 1, column 9 line 36, column 10 lines 1-8),

wherein using said line head ink-jet printer includes: using inks having a surface tension of 25 to 45 mN/m at 23°C for said inks of each color (Table 1), and using a recording material, onto which said ink droplets are discharged, that (i) has an ink absorption amount in 100 msec of 15 mL/m² or more (Table 1, ink absorption amount depending on the type of ink used from about 1.0-5.0 mL/m²*msec^{-1/2} = 10 - 50 mL/m²), and (ii) includes at least one of (a) a coated paper having a porous coating layer, (b) a glossy paper having a glossy recording surface, and (c) an OHP recording sheet having a porous coating layer on a transparent base material (column 20 lines 63-67).

Koitabashi ('092) does not explicitly teach the line head inkjet printer is configured such that an interval between a discharge of a droplet of an ink of a first

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color and a discharge of a successive droplet of an ink of a second different color is 50 msec to 200 msec. However, Koitabashi ('092) does teach that the ejection time difference can be reduced to less than one second to downsize the apparatus and form good images (column 12 lines 59-65).

Koike et al. ('438) teaches an inkjet recording method in which recording is executed by discharging inks of different colors as droplets of ink to be attached onto a recording material (Abstract, Column 3 lines 8-11), and an interval between a discharge of a droplet of an ink of a first color and a discharge of a successive droplet of an ink of a second different color is 50 msec to 200 msec (Abstract, column 3 lines 12-15; wetting time for first ink is 50-200 msec).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have an interval between a discharge of droplets of a first color ink and a second color ink to be 50 msec to 200 msec to provide images with no color ink spread and sharp character/line images on a recording medium with no loss in recording speed (Koike ('438) column 2 lines 61-65).

Regarding claim 4:

Koitabashi et al. ('092) teaches a line head ink-jet printer (Fig 1, column 9 line 36) in which recording is executed by discharging inks of different colors as droplets of ink to be attached onto a recording material (column 9 lines 44-49, column 10 lines 1-8), comprising:

a plurality of line heads for inks of different colors (Fig 1), wherein the line head ink-jet printer discharges successive ink droplets via the plurality of line heads (Fig 1, column 9 line 36, column 10 lines 1-8). (b) uses inks having a surface tension of 25 to 45 mN/m at 23°C for said inks of each color (Table 1), and discharges said ink droplets onto a recording material (i) that has an ink absorption amount in 100 msec of 15 mL/m² or more (Table 1, ink absorption amount depending on the type of ink used from about 1.0-5.0 mL/m²*msec^{-1/2} = 10 - 50 mL/m²), and (ii) includes at least one of (1) a coated paper having a porous coating layer, (2) a glossy paper having a glossy recording surface, and (3) an OHP recording sheet having a porous coating layer on a transparent base material (column 20 lines 63-67).

Koitabashi ('092) does not explicitly teach the line head inkjet printer is configured such that an interval between a discharge of a droplet of an ink of a first color and a discharge of a successive droplet of an ink of a second different color is 50 msec to 200 msec. However, Koitabashi ('092) does teach that the ejection time difference can be reduced to less than one second to downsize the apparatus and form good images (column 12 lines 59-65).

Koike et al. ('438) teaches an inkjet recording device in which recording is executed by discharging inks of different colors as droplets of ink to be attached onto a recording material (Abstract, Column 3 lines 16-20), and an interval between a discharge of a droplet of an ink of a first color and a discharge of a successive droplet of an ink of a second different color is 50 msec to 200 msec (Abstract, column 3 lines 23-28; wetting time for first ink is 50-200 msec).

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It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have an interval between a discharge of droplets of a first color ink and a second color ink to be 50 msec to 200 msec to provide images with no color ink spread and sharp character/line images on a recording medium with no loss in recording speed (Koike ('438) column 3 lines 1-3).

Moreover, the phrase "uses inks having a surface tensionof each ink color" is construed as an intended use and/or method steps of using the application and therefore the apparatus taught by the Koitabashi reference only need to be capable of performing such use. Case law holds that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458,459 (CCPA 1963). It is the examiner's position that the preamble does not state any distinct definition of any of the claimed invention's limitations and further that the purpose or intended use, i.e. uses inks having a specific surface tension, recited in the present claims does not result in a structural difference between the presently claimed invention and the prior art invention and further that the prior art structure which is an apparatus identical to that set forth in the present claims is capable of performing the recited purpose or intended use.

Regarding claims 3 and 6:

Koitabashi ('092) and Koike ('438) as applied to claims 1 and 4 above, respectively. Koitabashi does not explicitly teach the recording material has an ink absorption amount in 100 msec between 15 and 99 mL/m². However, given that the Koitabashi reference discloses a range of ink absorption amount more (Table 1, ink absorption amount depending on the type of ink used from about 1.0-5.0 mL/m²*msec^{1/2} = 10 - 50 mL/m²) that overlap with the presently claimed range, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize any of the taught ranges, including those presently claimed, to obtain a suitable composition.

It is also noted that according to MPEP 2131.03 and MPEP 2144.05, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results. As to optimization results, a patent will not be granted based upon the optimization of result effective variables when the optimization is obtained through routine experimentation unless there is a showing of unexpected results which properly rebuts the prima facie case of obviousness. See *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). See also *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990). In addition, a prima facie case of obviousness exists because the claimed ranges "overlap or lie inside ranges disclose by the prior art", see *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976; *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)

Regarding claims 7 and 8:

Koitabashi ('092) and Koike ('438) as applied to claims 1 and 4 above, respectively. Koitabashi does not explicitly teach the recording material has an ink absorption amount in 100 msec is between 15 and 40 mL/m². However, given that the Koitabashi reference discloses a range of ink absorption amount more (Table 1, ink absorption amount depending on the type of ink used from about 1.0-5.0 mL/m²*msec^{1/2} = 10 - 50 mL/m²) that overlap with the presently claimed range, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize any of the taught ranges, including those presently claimed, to obtain a suitable composition.

It is also noted that according to MPEP 2131.03 and MPEP 2144.05, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results. As to optimization results, a patent will not be granted based upon the optimization of result effective variables when the optimization is obtained through routine experimentation unless there is a showing of unexpected results which properly rebuts the prima facie case of obviousness. See *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). See also *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990). In addition, a prima facie case of obviousness exists because the claimed ranges "overlap or lie inside ranges disclose by the prior art", see *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976; *In re Woodruff*, 919 F.2d 1575, 16USPQ2d 1934 (Fed. Cir. 1990)

Regarding claims 9 and 10:

Koitabashi ('092) and Koike ('438) as applied to claims 1 and 4 above, respectively. Koitabashi does not explicitly teach the recording material has an ink absorption amount in 100 msec is between 18 and 40 mL/m². However, given that the Koitabashi reference discloses a range of ink absorption amount more (Table 1, ink absorption amount depending on the type of ink used from about 1.0-5.0 mL/m²*msec^{1/2} = 10 - 50 mL/m²) that overlap with the presently claimed range, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize any of the taught ranges, including those presently claimed, to obtain a suitable composition.

It is also noted that according to MPEP 2131.03 and MPEP 2144.05, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results. As to optimization results, a patent will not be granted based upon the optimization of result effective variables when the optimization is obtained through routine experimentation unless there is a showing of unexpected results which properly rebuts the prima facie case of obviousness. See *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). See also *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990). In addition, a prima facie case of obviousness exists because the claimed ranges "overlap or lie inside ranges disclose by the prior art", see *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976; *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)

Regarding claims 11 and 15:

Koitabashi ('092) and Koike ('438) as applied to claims 1 and 4 above, respectively. Koitabashi teaches each of said inks of each color includes an organic solvent (column 5 lines 1-37, glyceline used as a solvent) Koitabashi does not explicitly teach the said organic solvent is 5 to 50% of a total ink mass. However, given that the Koitabashi reference discloses a range of organic solvent in the ink (column 5 lines 1-35; glyceline 5 parts) that overlap with the presently claimed range, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize any of the taught ranges, including those presently claimed, to obtain a suitable composition.

It is also noted that according to MPEP 2131.03 and MPEP 2144.05, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results. As to optimization results, a patent will not be granted based upon the optimization of result effective variables when the optimization is obtained through routine experimentation unless there is a showing of unexpected results which properly rebuts the prima facie case of obviousness. See *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). See also *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990). In addition, a prima facie case of obviousness exists because the claimed ranges "overlap or lie inside ranges disclose by the prior art", see *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976; *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)

Regarding claim 13:

Koitabashi ('092) and Koike ('438) as applied to claims 1 above. Koitabashi teaches each of the inks includes one of an anion surfactant, a cation surfactant, a nonionic surfactant, and an ampholytic surfactant (column 5 lines 5-32, line 37-38).

Claims 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koitabashi et al. (US 6,916,092) and Koike et al. (US 5,608,438) as applied to claims 11 and 15 above, and further in view of Koitabashi et al. (US 2002/0097290).

Regarding claims 12 and 16:

Koitabashi ('092) and Koike ('438) as applied to claims 11 and 15 above, respectively. Koitabashi ('092) does not explicitly teach the said organic solvent is 10 to 35% of the total ink mass.

Koitabashi ('290) teaches the use of similar inks with similar characteristics to include an ink solvent containing water and an organic solvent (Title; Abstract; Detailed Description, Paragraph [0207] and Paragraph [0229]) these organic solvents make up 10-35% of the total mass of the inks (Paragraph [0229] lines 18-22).

Given the same field of endeavor, specifically an ink-jet printer which merely discharges ink and uses recording material, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the method and apparatus of ink-jet recording using any of a variety of available inks as taught by the combination of Koitabashi et al. and Koike et al. teaches with the specific

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ink-jet recording ink that was readily available to one of ordinary skill in the art at the time of the invention, with the further detailed depiction of the ink in use as taught by Koitabashi et al. ('290) in an effort to use the most effective ink available as an improvement over the existing options at the time particularly in super high speed printers with full line head printing capabilities (Koitabashi et al. ('290) - Detailed Description, Paragraph [0042]), while merely using that which was available to one of ordinary skill in the art at the time of the invention, in this case to the same inventor [i.e. Koitabashi et al.].

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koitabashi et al. (US 6,916,092) and Koike et al. (US 5,608,438) as applied to claims 1 above, and further in view of Sakaki et al. (US 6,174,056).

Regarding claim 14:

Koitabashi ('092) and Koike ('438) as applied to claims 11 and 15 above, respectively. Koitabashi ('092) does not explicitly teach each of said inks of each color includes one of a pH adjuster, an amine, chelating reagent, preservative, antirust, and ultraviolet absorber to each of said inks.

Sakaki ('056) teaches the use of similar inks with similar characteristics to include an ink solvent containing water and an organic solvent and further adding additional materials, fluids or components to the composition to improve the characteristics thereof including adding any of a variety of the claimed surfactants as well as pH adjusters,

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amines, preservatives, and ultraviolet absorbers (Column 4, Lines 10-16 & Lines 24-55 and Column 6, Lines 1-65) to each of the inks at some point in the recording process or preparation therefore.

Given the same field of endeavor, specifically an ink-jet printer which merely discharges ink and uses recording material, it is apparent that one of ordinary skill in the art at the time the invention was made would have been motivated to combine the method and apparatus of ink-jet recording using any of a variety of available inks as taught by the combination of Koitabashi et al. and Koike et al. teaches with the specific ink-jet recording ink that was readily available to one of ordinary skill in the art at the time of the invention, with the further detailed depiction of the ink in use as taught by Sakaki ('056) in an effort to improve ink characteristics which provide images having high density, high gloss and high resolution (Sakaki ('056) - Detailed Description, column 2 lines 16-26), while merely using that which was available to one of ordinary skill in the art at the time of the invention.

Response to Arguments

Applicant's arguments with respect to claims 1 and 4 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RUT PATEL whose telephone number is (571)270-7924. The examiner can normally be reached on MON - THU 9:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571)272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/R. P./

Examiner, Art Unit 2861

/MATTHEW LUU/

Supervisory Patent Examiner, Art Unit 2861